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Central Intelligence Agency



Washington, D.C. 20505

Directorate of Intelligence

September 1987

Probable SL-16 Space Launch Vehicle Program at Plesetsk
Missile and Space Test Center, USSR ☐

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Summary

The Soviets have been excavating a new space launchsite at the Plesetsk Missile and Space Test Center in the northwestern USSR since at least March 1987. Analysis of the launchsite and other probably related construction indicates that the new site will be used for launching the SL-16 medium-lift space launch vehicle, which is currently launched only from Tyuratam Missile and Space Test Center in the southern USSR. We expect the first of probably two SL-16 launchpads at Plesetsk to be operational in 1992. With more than twice the lift capability of the most powerful booster now launched from Plesetsk, the SL-16 would considerably enhance the Soviet ability to place heavy payloads into near-polar and sun-synchronous orbits.

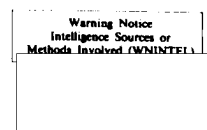
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Information available as of September 1987 was used in this report. (U)

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Soviet SL-16 Program at Tyuratam

The SL-16 is the new Soviet medium-lift launch vehicle. The Intelligence Community estimates it has the capability of placing up to 17,000 kilograms into low Earth orbit, about 10,000 kilograms more than the SL-4, the most powerful booster currently launched from Plesetsk. The SL-16 has two stages, both of which use liquid oxygen (LOX) and kerosene propellants. First launched from Tyuratam Missile and Space Test Center in 1985, 11 SL-16s had been launched as of 1 September 1987 (figure 1).

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The SL-16 launchsite at Tyuratam--Launchsite Y--consists of two launchpads (figure 2). Construction of the first launchpad, Y1, began in mid-1978. The pad was externally complete by December 1982, and the first SL-16 was launched from it in April 1985 after extensive on-pad compatibility testing. Excavation for pad Y2 did not begin until September 1981, and we do not expect this pad to become operational until 1989. Construction of the launch control center (LCC) began in 1978, and was completed before the first SL-16 launch. The LCC is about 230 meters from pad Y1 and about 200 meters from pad Y2. Additional facilities at the launchsite include kerosene and nitrogen storage bunkers, two spherical LOX storage tanks, a mobile service structure, and the first of probably two propellant drainage ponds.

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Soviet SL-16 Program at PlesetskThe Launchsite

In early 1987, the Soviets began excavation for a launchsite for the SL-16 at Plesetsk Missile and Space Test Center (figure 3). The new site is about 2,800 meters south of Launchsite 2. Launchsite 2, like nearby Launchsites 1 and 3, supports launches of the SL-3/4/6 vehicles which--like the SL-16--use LOX/kerosene propellants.

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By August 1987, the new site consisted of two excavated areas about 230 meters apart. These two areas are very similar in appearance and separation distance to the excavations at Tyuratam for the SL-16 launchpad Y1 and its LCC. This similarity suggests that the westernmost excavation at the new Plesetsk launchsite is for an SL-16 launchpad and that the easternmost excavation is for an LCC. This analogy further suggests that, when complete, this site will have other facilities resembling those of the SL-16 launchsite at Tyuratam, and that construction for an additional launchpad may begin within the next three years. The second launchpad would probably be located about 200 meters east of the LCC. The Soviets have always built at least two launchpads for each type of space launch vehicle launched at Plesetsk and at Tyuratam, so it is unlikely that only one SL-16 launchpad will be built at Plesetsk.

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Support Facilities

Concurrent support facility construction at Plesetsk and at the Tambov Missile Support Rear Depot further indicates that the new launchsite at Plesetsk is for the SL-16. [REDACTED]

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Construction began by March 1986 at Plesetsk for a probable LOX production facility, located about 6,600 meters southeast of the new launchsite (figure 4). By June 1987, the construction site contained foundations for the facility and footings for three 16-meter-diameter cryogen storage tanks. We expect this facility to become operational by 1992. [REDACTED]

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LOX is currently shipped to Plesetsk in cryogen railcars. The construction of the LOX production facility suggests a significant future increase in the use of LOX at Plesetsk. Such an increase in turn suggests either an expansion of the SL-3/4/6 program--since the SL-3/4/6 vehicles are the only boosters now launched from Plesetsk that use LOX--or that a new vehicle that uses LOX will be launched from Plesetsk. Because there is no evidence of expansion at the SL-3/4/6 facilities at Plesetsk and because we expect the new launchsite to become operational at about the same time as the LOX facility, we believe the LOX facility is probably intended to support a new program. In addition to the SL-3/4/6, only the SL-16 and SL-X-17 use significant amounts of LOX;¹ the lack of construction activity for the extensive support facilities required for the SL-X-17 suggests that the new vehicle at Plesetsk will be the SL-16. [REDACTED]

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Construction began in February 1986 for a probable SL-16 assembly and checkout building at the Plesetsk Missile Handling Facility. The building, located in a portion of the facility associated with the SL-8 space launch vehicle, will consist of twin, rail-served, high-bay sections, each about 131 meters long and 36 meters wide, and a central administrative/engineering section about 131 meters long and 24 meters wide (figure 5). The construction timing of this assembly and checkout building, the new launchsite, and the LOX facility suggests that the three are probably related. Since the SL-8 does not use LOX and the new launchsite does not resemble an SL-8 launchsite under construction, the new assembly and checkout building is probably for the SL-16 rather than the SL-8. [REDACTED]

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¹The SL-12 uses a small amount of LOX in its fourth stage, but the amount is probably too small to justify the construction of a LOX production facility. [REDACTED]

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A probable SL-16 support building has been under construction since January 1985 at the Tambov Missile Support Rear Depot (MSRD). [REDACTED]

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[REDACTED] The new building probably will be about 125 meters long and about 66 meters wide (figure 6). This building, which we believe will be completed by 1990, probably will be able to store at least 10 SL-16 airframes on handling dollies. [REDACTED]

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SL-3/4/6 launchpad service structure components have also been seen at the Tambov MSRD, and an SL-3/4/6 strap-on booster has been seen at the Glazov MSRD. Because the SL-3/4/6 is launched both from Tyuratam and Plesetsk, the Tambov and Glazov MSRDs probably serve--for reasons of economy or operational efficiency --as storage facilities for some SL-3/4/6-related components that are distributed as needed to both Plesetsk and Tyuratam, although most components are shipped directly to the launchsites from the production facilities. The construction of an SL-16 storage building at the Tambov MSRD suggests that the SL-16 will also be launched from both Plesetsk and Tyuratam. [REDACTED]

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Site Advantages

The SL-16 probably will be used to launch Soviet ELINT (electronics intelligence) and photoreconnaissance satellites, and other payloads too heavy to now be launched from Plesetsk. One useful orbit for reconnaissance-type satellites is the sun-synchronous retrograde orbit. [REDACTED]

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[REDACTED] this orbit makes it possible to image a target at the same time each day, optimizing lighting conditions. Though not previously used for Soviet reconnaissance satellites, the [REDACTED]

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[REDACTED] SL-16 launch of a test payload into a near-sun-synchronous orbit suggests that the Soviets intend to use such orbits in the future. [REDACTED]

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The major advantage of launching into retrograde orbits at Plesetsk is probably safety. A vehicle launched from Tyuratam into a retrograde orbit is launched southwest, avoiding major Soviet cities to the northwest; however, the vehicle would fly over Iran before the payload reached orbit; an in-flight failure could result in the vehicle crashing in Iran or on the Arabian peninsula. A vehicle launched at Plesetsk can be launched north into a retrograde orbit, overflying the polar region. Because the negative effects of the earth's rotation on retrograde launches is reduced at higher latitude launchsites, an energy savings also occurs in retrograde launches from Plesetsk. This savings means slightly heavier payloads could be launched from Plesetsk than from Tyuratam. [REDACTED]

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